

Between Mars and Jupiter there is a belt of asteroids that orbit the Sun. Asteroids are smaller, rocky space objects. Some are quite large and have other asteroids orbiting them. The largest asteroid, Ceres, has been classified as a dwarf planet, similar to Pluto. Beyond the last planet, Neptune, there is another ring of small bodies similar to the asteroid belt, called the Kuiper belt. Space objects within the Kuiper belt are rocks and ice objects. Three of the larger bodies within the Kuiper belt—Pluto, Haumea and Makemake—are currently classified as dwarf planets. The Solar System also includes human-made objects, such as space probes (robotic spacecraft sent to collect information), space stations and satellites.

Sizes and characteristics of space objects

The distances between the major objects, for example, planets, in the Solar System can be difficult to imagine because they are so large. Light, which is the fastest thing in the universe, takes about eight minutes to travel from the Sun to Earth. In this lesson students are asked to investigate the characteristics, including sizes and distances, between the planets and the Sun.

Data on the eight planets in our Solar System

Space object	Average distance from Sun (in millions of km)	Approximate year length (in Earth units)	Approximate day length (in Earth units)	Diameter
Mercury	58	88 days	176 days	4,879 km
Venus	108	225 days	243 days	12,100 km
Earth	150	1 year	1 day	12,756 km
Mars	228	686 days	25 hours	6,780 km
Jupiter	778	12 years	10 hours	142,984 km
Saturn	1,427	30 years	10 hours	120,540 km
Uranus	2,870	84 years	17 hours	51,118 km
Neptune	4,497	165 years	18 hours	49,528 km

Students' conceptions

Students often have little understanding of the sizes of different space objects and the distances between them.

Some students might believe that the Solar System only contains the Sun, planets and moons. However, it also contains other natural objects, such as comets and asteroids, and human-made objects, for example, space probes.

Students might think that the Solar System contains the stars they see in the night sky. However, the Solar System only contains one star, the Sun. The lights we see in the sky come from stars many light years distant, which might have systems of their own.

Students might have little awareness of the difference between stars and planets. Stars are massive space objects and produce their own light through nuclear fusion. Planets can be rocky or gaseous, but they are much smaller and colder than stars and do not produce their own light.